



# CEREBRAL PALSY: A MENTAL HANDICAPNESS.

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“Sometimes Even the Greatest Joys Bring Challenge, And Children with Special Needs Inspire a Very, Very Special Love”

## **INTRODUCTION: -**

The healthy newborn infant born at term between 38 and 42 weeks, cries immediately after birth, establishes independent rhythmic respiration, quickly adapts with the extra-uterine environment, having an average birth weight and no congenital anomalies [1]. Some parents and their family members adjust easily to the new changes in their lifestyles, whereas others find it difficult to cope with these changes and feel varying degrees of turmoil and anxiety [2]. This is especially true if the baby is not the robust, healthy, lovable infant who was expected [3].

The neonates are ‘at risk’ for various health problems, even though they born with average birth weight. The morbidity and mortality rates in newborn infants are high [4]. Diseases of nervous system are common in children. Almost 20 to 30% of children are victims of neurological illnesses. These are major contributors to childhood morbidity and disability. Neurological disorders of infancy and childhood are different than in adults. Neurological symptoms are also found in association with various systemic diseases. Common disease condition in children involving CNS

includes congenital malformations, perinatal problems (birth asphyxia, birth injury) developmental disabilities (cerebral palsy), CNS infections and brain tumor [1].

Around 15 per cent of the world's population, or estimated 1 billion people, live with disabilities. They are the world's largest minority. This figure is increasing through population growth, medical advances and the ageing process, says the World Health Organization. 80% of persons with disabilities live in developing countries, according to the UN Development Program [5].

As per the Census 2011, the differently abled population in India is 26.8 million. In percentage terms, this stands at 2.21 %. There has been a marginal increase in the differently abled population in India, with the figure rising from 21.9 million in 2001 to 26.8 million over the period of 10 years [6].

Despite differing estimates, about 4-8% of the population in India is differently abled. [7] One in every 10 children is born with or acquires a physical, mental or sensory disability.[8] These translate into 40-90 million children's, which is a substantial number.[7]

According to the Oxford Dictionary, a disability could be described as an impairment which can be Intellectual, limitations, cognitive, improvement, sensory, exercise or the mixture of all these. Incapacity impacts a person's activities and may happen at birth. Sometimes, it could happen in adulthood. [6]

Developmental disabilities encompass a broad range of conditions that result from cognitive and/or physical impairments. They are identified before the age of 22, and usually last throughout a person's lifetime. These disabilities include intellectual disabilities, cerebral palsy, autism spectrum disorder, Down syndrome, language and learning disorders, vision impairment, and hearing loss. [9]

About 3/4th of the children is considered as unhealthy and surviving with impairment of physical and intellectual functions due to poor health status. Early detection and anticipation of the problems may prevent impairment, disability and fatal outcome [1]. The most common developmental disability is intellectual disability. Cerebral palsy is the second most common

developmental disability, followed by autism spectrum disorder. Other developmental disabilities may include Attention-Deficit/Hyperactivity Disorder, Angel man Syndrome, Bipolar Disorder, Down syndrome, Fragile X Syndrome, Neural Tube Defects, Phenylketonuria, Tourette syndrome [9]

### **Cerebral palsy**

(CP) is a group of disorders that affect a person's ability to move and maintain balance and posture. CP is the most common motor disability in childhood. Cerebral means having to do with the brain. Palsy means weakness or problems with using the muscles. CP is caused by abnormal brain development or damage to the developing brain that affects a person's ability to control his or her muscles.



### **Symptoms**

The symptoms of CP vary from person to person. A person with severe CP might need to use special equipment to be able to walk or might not be able to walk at all and might need lifelong care. All people with CP have problems with movement and posture.

Many also have related conditions such as intellectual disability; seizures; problems with vision, hearing, or speech; changes in the spine (such as scoliosis); or joint problems (such as contractures) [10].

### **Movement and coordination**

Stiff muscles and exaggerated reflexes (spasticity), the most common movement disorder, Variations in muscle tone, such as being either too stiff or too floppy, Stiff muscles with normal reflexes (rigidity), Lack of balance and muscle coordination (ataxia), Tremors or jerky involuntary movements, Slow, writhing movements, Favoring one side of the body, such as only reaching with one hand or dragging a leg while crawling, Difficulty walking, such as walking on toes, a crouched gait, a scissors-like gait with knees crossing, a wide gait or an asymmetrical gait, Difficulty with fine motor skills, such as buttoning clothes or picking up utensils.

### **Speech and eating**

Delays in speech development, Difficulty speaking, Difficulty with sucking, chewing or eating, Excessive drooling or problems with swallowing.

### **Development**

Delays in reaching motor skills milestones, such as sitting up or crawling, learning difficulties, Intellectual disabilities, Delayed growth, resulting in smaller size than would be expected.

### Other problems

Damage to the brain can contribute to other neurological problems, such as: Seizures (epilepsy), Difficulty hearing, Problems with vision and abnormal eye movements, Abnormal touch or pain sensations, Bladder and bowel problems, including constipation and urinary incontinence, Mental health conditions, such as emotional disorders and behavioral problems

The brain disorder causing cerebral palsy doesn't change with time, so the symptoms usually don't worsen with age. However, as the child gets older, some symptoms might become apparent. Muscle shortening and muscle rigidity can worsen if not treated aggressively [11].

### Types

Here are different types of CP. Some people have one type, or a mix of:

1. Spastic Cerebral Palsy, which causes stiffness and trouble moving.
2. Dyskinetic (Athetoid) Cerebral Palsy, which causes uncontrolled movements.
3. Ataxic Cerebral Palsy, which causes a problem with balance and depth perception (judging the distance between two objects).

### Causes

The cause of CP isn't always known. But many cases happen when a child's brain is still developing, such as before birth or in early infancy. This may be due to:

1. infections or other medical problems during a woman's pregnancy
2. a stroke either in the womb or after birth
3. untreated jaundice (a yellowing of the skin and whites of eyes)
4. genetic disorders

In rare cases, CP happens because something goes wrong during a child's birth [12].

Prematurity and low birthweight births are the most significant considerations in reducing the overall incidence of CP. Antenatal administration of magnesium sulfate, when premature birth is imminent before 32 weeks of gestation and has been shown to confer neuroprotection and reduce the risk of CP development in neonates [13,14].

Areas of the brain that affect learning can also be affected. This can lead to learning disabilities. Brain damage also can happen from:

1. lead poisoning
2. bacterial meningitis
3. poor blood flow to the brain
4. being shaken as an infant (shaken baby syndrome)
5. an injury from an accident (like a car accident) [12].

### **Prevention**

Most cases of cerebral palsy can't be prevented, but you can reduce risks. If you're pregnant or planning to become pregnant, you can take these steps to keep healthy and minimize pregnancy complications:

Vaccination: Getting vaccinated against diseases such as rubella, preferably before getting pregnant, might prevent an infection that could cause fetal brain damage.

Healthy lifestyle: The healthier you are heading into a pregnancy, the less likely you'll be to develop an infection that results in cerebral palsy.

Early prenatal care & checkups: Regular visits to doctor during pregnancy is a good way to reduce health risks to mother and unborn baby. Seeing doctor regularly can help prevent premature birth, low birth weight and infections.

Avoid alcohol, tobacco and illegal drugs. These have been linked to cerebral palsy risk.

Rarely, cerebral palsy can be caused by brain damage that occurs in childhood. Practice good general safety. Prevent head injuries by providing child with a car seat, bicycle helmet, safety rails on the bed and appropriate supervision [11].

### **Diagnosis**

Novak et al. [2017], based on their systematic review of literature published between 1988 and 2016, contend that it is possible to accurately diagnose CP in early infancy. They reported that early and accurate diagnosis of CP is possible based on a combination of findings from medical history, neuroimaging, and standardized individually administered neurological and motor assessment tools [15]. In some cases where the signs and symptoms are mild, diagnosis may be delayed longer. A series of tests can be done to rule out cerebral palsy.

Brain scans: Brain-imaging technologies can reveal areas of damage or abnormal development in the brain. These tests might include the following:

MRI: An MRI can often identify lesions or abnormalities in child's brain. This test is painless, but it's noisy and can take up to an hour to complete. Child will likely receive a sedative or light general anesthesia beforehand.

Cranial ultrasound: can be performed during infancy. An ultrasound doesn't produce a detailed image, but it may be used because it's quick and it can provide a valuable preliminary assessment of the brain.

Electroencephalogram (EEG): If child is suspected of having seizures, an EEG can evaluate the condition further. Seizures can develop in a child with epilepsy. In an EEG test, a series of electrodes are attached to child's scalp. The EEG records the electrical activity of child's brain. It's common for there to be changes in normal brain wave patterns in epilepsy.

Laboratory tests: Tests of the blood, urine or skin might be used to screen for genetic or metabolic problems.

Additional tests: If child is diagnosed with cerebral palsy, you'll likely be referred to specialists to test child for other conditions often associated with the disorder. These tests can identify problems with: Vision, Hearing, Speech, Intellect, Development, Movement, Other medical conditions [11]

## Treatment

When the child is diagnosed with cerebral palsy (CP), early treatments can really improve their life. These will focus on ways to help them get around more easily, reduce pain, and succeed at daily tasks.

CP can affect child in many ways, such as the way that they walk, hold things, talks and eats. There's no one-size-fits all treatment for the condition. The condition affects each child differently.

Once the child is diagnosed, they will not only be followed by their pediatrician, but have a medical team that may include a neurologist and an orthopedist. The doctor will want to see them on a regular basis to make sure the treatments are helping to improve the way that they act and feel.

As a rule, children with cerebral palsy visit the doctor more often than other kids. They tend to have more health issues that require treatment [16].

**Physical Therapy:** Physiotherapy has been shown to improve muscle strength, local muscular endurance and joint range of movement in children with CP [17]. Children with CP usually referred for physical therapy as early as possible so that they can learn how to move with better balance, strengthen their muscles or maintain their current muscle tone. They'll do exercise to help stretch their muscles, which may reduce spasms. They'll get a special exercise program that's tailored to their need [16].

**Occupational Therapy:** Occupational therapy is an integral component in the interdisciplinary treatment of individuals with CP, with various studies demonstrating its long-term effects on promoting improvement in fine motor functionality [18].

It's harder to complete daily tasks like getting dressed, brushing teeth, using scissors and writing on the classroom board with the movement issues. An occupational therapist can give the child extra help with chores like these, based on their own needs, to help them improve at the tasks that they do at home and at school. They will also help put into place adaptive technology to support child in the classroom.

**Speech Therapy:** Some children with cerebral palsy have trouble speaking well because the muscles that work their mouths are affected. If the child needs help, a speech and language therapist may help them learn to form words and speak more clearly. If the child can't speak, he/ she can learn other ways to communicate, such as sign language.

If CP affects the child's mouth and throat muscles, they may drool or have eating problems. Therapy that can teach them how to better control these muscles, including their tongue, and help to improve those issues.

**Devices:** A device like a brace or splint may make it easier for the child to walk or move their arms. Other equipment, like special chairs, can help make the child more comfortable when they sit.

For more severe forms of CP, the child may need a walker, scooter, or wheelchair to get around, or special computer software to help them communicate if they are unable to speak on their own. There are even special-made tools like forks to pencils to make everyday tasks easier.

**Medicine:** Cerebral palsy often causes muscle spasms in different parts of the body, so medications are prescribed to relax those muscles and make it easier for them to move around with more control. The type of drug they will receive depends upon their symptoms and how mild or severe the condition is.

Some drugs, often for mild cases, are taken by mouth. Another drug is injected. And a medication for severe cases is given through an implanted pump.

**Surgery:** Children whose muscles are very stiff, or spastic may have surgery to lengthen some leg muscles or tendons. This can make walking easier and less painful. Doctors may hold off on this type of surgery until a child has reached a certain age or level of development. This can help ensure that the surgery does not lead to long-term problems.

Children whose severe muscle spasms cannot be controlled with drugs, physical therapy, or other means may have surgery. The surgeon may cut nerves in the spinal column that are overactive. This can help the muscle to relax, and it may lead to less pain [16].

### **Conclusion**

Cerebral palsy is a term used to describe a group of disorders that are caused by a non-progressive brain abnormality, which results in difficulty with movement, tone, and/or posture. There are several factors during pregnancy, around the time of birth, and after birth that play a role in the development of cerebral palsy. The significant risk factors for cerebral palsy are prematurity and low birth weight.

Although there is no cure for cerebral palsy, but multidisciplinary health team should aim to recognize the signs of cerebral palsy and make the diagnosis of cerebral palsy, or "high risk of cerebral palsy" as early as possible, as early diagnosis can improve functional outcomes and reduce disease burden because starting interventions early can optimize neuroplasticity.

Delays in diagnosis can be harmful to parent's and caregiver's as well. Despite the best treatment, there is a significant reduction in the lifespan of most individuals with cerebral palsy. A timely diagnose allows parents to receive psychological support and resources. Patients with known risk factors for cerebral palsy should receive a referral for further diagnostic testing, including neuroimaging and standardized developmental assessments.

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